

GYNANDROMORPHISM IN THE ANT *PHEIDOLE DENTATA* MAYR
(HYMENOPTERA: FORMICIDAE)

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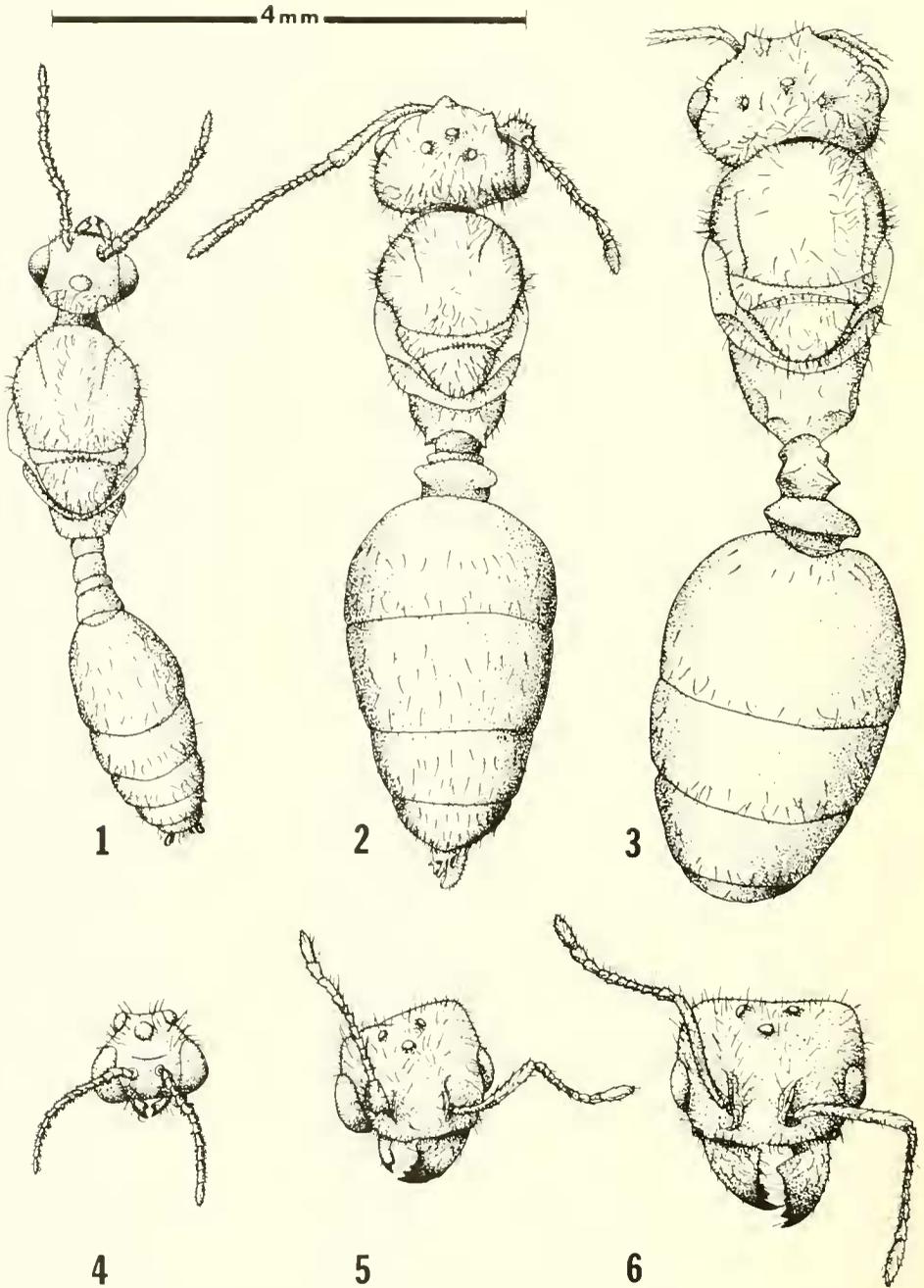
Abstract.—A gynandromorph of the ant *Pheidole dentata* Mayr is described. It was found in a colony collected on the Texas Tech University campus, Lubbock. While the most notable differences occur in the head, the specimen is intermediate in size, with the right half of all body regions exhibiting discrete male characteristics. The external genitalia are predominantly male, whereas the internal reproductive system is female.

Gynandromorphism is a condition in which both male and female characters are discretely present in one individual (Donisthorpe, 1929; Hall and Smith, 1953). In ants, the various combinations of male and female forms include queen-male (gynandromorph), worker-male (ergatandromorph), and soldier-male (diner-gatandromorph) (Donisthorpe, 1929). Berndt and Kremer (1983) have proposed several new categories of gynandromorphism in ants based not only upon the dominant sex, but the dominant caste as well. These new categories include gynergatandromorph (queen-worker), ergatogynandromorph (worker-queen), and androergatogynomorph (male-worker).

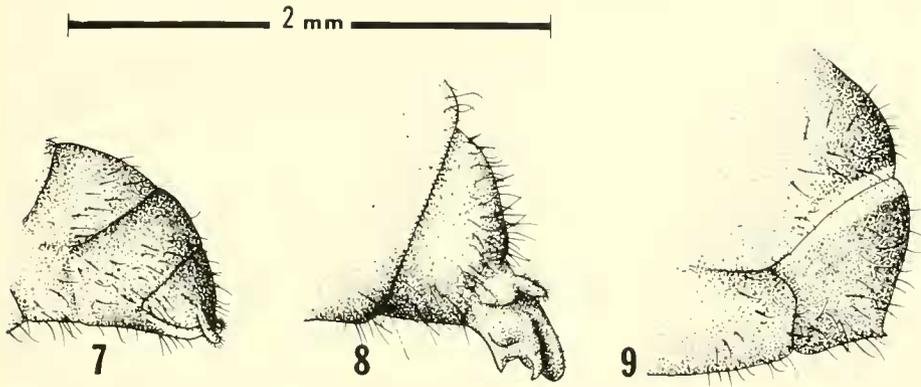
Insect gynandromorphism has been studied both genetically and cytologically. From such studies, various mechanisms have been derived to explain the phenomenon of gynandromorphism, most of which include fertilization anomalies and cytogenetic abnormalities during embryogenesis (Morgan and Bridges, 1919; Rothenbuhler et al., 1952; Brust, 1966). Although Wheeler (1903) suggested causes for gynandromorphism in ants, the definitive causes remain unknown (Berndt and Kremer, 1982).

Gynandromorphism has been reported from 41 species in 22 genera of ants (Donisthorpe, 1929; Wheeler, 1931, 1937; Buschinger and Stoewesand, 1971; Hung et al., 1975; Cokendolpher and Francke, 1983; Berndt and Kremer, 1983). However, Vandel (1931) has provided the only record of a gynandromorph from the genus *Pheidole*. A dinergatandromorphic specimen of *Pheidole pallidula* Nylander was discovered in which the right side of the head contained soldier characteristics, and the left side of the head contained male characters. Therefore, the specimen described herein represents not only the first gynandromorph of *Pheidole dentata* Mayr, but the first description of a gynandromorph *sensu stricto* from this genus.

The specimen was discovered in a colony collected from the campus of Texas Tech University, Lubbock, on July 1, 1984. It is preserved along with normal



Figs. 1-6. *Pheidole dentata* Mayr. 1, Dorsal view of male. 2, Dorsal view of gynandromorph, wings omitted. 3, Dorsal view of queen. 4, Frontal view of normal male head. 5, Frontal view of gynandromorph head. 6, Frontal view of normal queen head.



Figs. 7-9. *Pheidole dentata* Mayr. 7, Lateral view of terminalia of male. 8, Lateral view of terminalia of gynandromorph, genitalia everted. 9, Lateral view of terminalia of queen.

male and female siblings (cat. no. 6480) in the Entomological Collection, The Museum, Texas Tech University.

The gynandromorph is intermediate in size between a normal queen and a normal male (Figs. 1-3). Male characteristics are generally confined to the right half of the gynandromorph. The thorax appears twisted to the male side, with both right wings noticeably shorter than those on the left. No differences in wing venation were observed between male, female, and gynandromorph. The petiole and propodeum are decidedly female, with the gaster appearing predominantly queen-like, but intermediate in size between a male and queen. The gynandromorph contains four gastric segments as does a normal queen, whereas a normal male contains five segments. The most noticeable differences are found on the head (Figs. 4-6). Again, the right half of the gynandromorph head has male characteristics, giving the head an asymmetrical appearance. The right mandible is shaped like that of a normal male, though larger. The left mandible is like that of a queen, but somewhat smaller. The right compound eye of the gynandromorph resembles that of a male, and the left resembles that of a queen. The ocelli are distinctly queen-like. The right antennal scape of the gynandromorph is malformed, being similar in length to a normal male, but considerably wider. Despite the male-like scape, both antennae contain twelve segments, as do the antennae of a normal queen. A normal male contains thirteen antennal segments. The right frontal carina is less pronounced than that of the left. The gynandromorph has everted genitalia resembling those of a normal male, though malformed (Figs. 7-9). A normal female reproductive system was observed after dissection of the abdomen. No developing oocytes were observed. The gynandromorph is pale yellow in color, similar to a male. The posterior portion of the abdomen is somewhat darker in color, resembling that of a queen.

ACKNOWLEDGMENTS

This work was supported by the Texas Department of Agriculture Interagency Agreement IAC 0853, contribution number T-10-160, College of Agricultural Sciences, Texas Tech University. We thank Oscar F. Francke, James Johnson,

and Harlan Thorvilson for their comments on the manuscript. Appreciation is also extended to James Cokendolpher for his valuable assistance in examination of the gynandromorph's internal anatomy. We thank Mary Peek for typing the various drafts of the manuscript.

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